

MANCHESTER AND SALFORD

SANITARY ASSOCIATION.

A N A L Y S I S

OF THE

W E E K L Y R E T U R N

OF THE

Health & Meteorology of Manchester,

FROM SEPTEMBER 8TH, 1860, TO DECEMBER 28TH, 1861.

BY

ARTHUR RANSOME, M.B., M.A. CANTAB., M.R.C.S.,

AND

GEORGE V. VERNON, F.R.A.S., M.B.M.S.

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Communications for the Committee may be addressed to—

THOMAS TURNER, Esq., Chairman,
77, Mosley Street.

C. E. CAWLEY, Esq., Deputy Chairman,
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ERNEST REUSS, Esq., Treasurer,
Portland Street.

To

The Honorary Secretaries { A. RANSOME, Esq., St. Peter's Square.
C. H. KNIGHT, Esq., 75, Mosley Street.

Or to

Mr. C. G. CARTLEDGE, Secretary,
At the Offices of the Association, 33, Pall Mall,
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ANALYSIS
OF THE
WEEKLY RETURN
OF THE
MANCHESTER AND SALFORD SANITARY ASSOCIATION,
FROM SEPTEMBER 8TH, 1860, TO DECEMBER 28TH, 1861.

GENTLEMEN,

The weekly returns entitled "Health and Meteorology of Manchester," having now been published regularly for more than twelve months, it has been thought desirable to present to you a few notes upon the tables which they contain.

In laying before you the following analysis of your weekly return, however, we would wish to state, at the outset, that any conclusions drawn from the statistics therein contained can as yet have no decided foundation. We have endeavoured to indicate the direction to which the facts seem to point, but the period over which the enquiry extends is much too short to permit of scientific accuracy, and the experience of future years may contradict many of our present opinions. We may observe, however, that in several instances the conclusions of your former Sub-Committee on Meteorology, drawn from the tables of the Board of Health, in London, seem to be fully borne out by the present investigation. The extraordinary regularity with which the returns to your publication are made by your several contributors, gives promise of a series of statistics on this subject which will be the most valuable record of the kind ever obtained, and from which many really important conclusions may be drawn. The enquiry may be divided into the following heads:— 1. The meteorology of the district. 2. Influence of atmospheric changes upon disease. 3. Comparison between the health of Manchester and St. Marylebone, London.

1.—METEOROLOGY OF MANCHESTER AND ITS SUBURBS.

In the first place, let us cordially acknowledge the very valuable co-operation of Alderman Neild, Bowdon; Jno. Atkinson, Esq., F.G.S., of Thelwall; Jno. Curtis, Esq., M.B., M.S., of Sale; and Arthur Neild, Esq., M.B., M.S., of Ollerenshaw; without the assistance of these gentlemen it would have been impossible for us to have given any account of the climate round Manchester, more especially as there are very few observers in this district who possess standard instruments; and, although the deductions we can at present make are very few and uncertain, we may hope in future years that a complete series of observations will be obtained, from which valuable results will be forthcoming.

The curves which accompany this Report exhibit the mean temperature at Old Trafford, compared with the average of the last twelve years; the degree of humidity; the mean daily range of temperature; and the mean weekly reading of the barometer.

On examining the curves of temperature, a few weeks will be found which possessed a temperature greatly below the average. The principal ones were as follows:—the weeks ending September 15-29, October 13, November 24, December 22-29, 1860; and the weeks ending January 5-12-19, February 16, May 11, November 16, and December 28, 1861. Between May 11 and November 16 there were no very notable depressions of the mean weekly temperature, but a few weeks had a temperature a good deal above the average, especially in June and August.

A comparison of the mean weekly temperatures at the Royal Infirmary with those at Old Trafford, gives the following results:—from November 17, 1860, to March 2, 1861, the mean temperature at the Royal Infirmary was in excess of that at Old Trafford; from March 9, 1861, to September 7, 1861, the mean temperature at Old Trafford was in excess of that at the Royal Infirmary; from the week ending September 14, the mean temperature at the Royal Infirmary was above that at Old Trafford every week until the end of the year, with the exception of the week ending October 26.

The same remarks apply to the other stations, with the exception of Ollerenshaw, which, owing to its much greater altitude, does not conform to what we have stated above.

The general conclusions which may be deduced from these observations are as follows :—

During the winter half of the year, the large amount of radiation in the suburban districts causes a great diminution of temperature in these districts, as compared with the urban districts, and we have consequently a lower temperature in the suburbs than in the centre of cities during winter. The great consumption of fuel in large cities like Manchester tends, to some extent, to produce the effect just alluded to.

In the summer half of the year, the dense atmosphere of Manchester prevents the solar rays acting with their full force, and, consequently, we have a lower temperature in the centre of Manchester, during the summer, than in the suburbs.

The mean weekly, and diurnal ranges of temperature are also much less in the city than in the suburbs, owing to the same cause.

Comparisons of the amount of humidity at the various stations appears to show that considerable irregularity exists during the winter months ; but, during the summer months, the suburban and country districts appear to possess a much less degree of humidity than the urban districts.

Ozonometers being placed at only three of the stations, has, to some extent, interfered with any very careful investigation, but the following remarks may tend to induce other observers to take it up :— From observations made some time ago at the Royal Infirmary, it does not appear that Ozone can be detected in the centre of Manchester ; at Old Trafford it occurs often in large quantities, with the wind from S.E., S.S.W., W., and N.W., but none with the wind in any other direction ; it is also rarely found when the temperature is excessively low, except it is accompanied by a stormy wind from one of the points named above ; at Thelwall it appears to exist with the wind from all the points of the compass, especially if the air is warm and moist ; at Ollerenshaw Ozone exists in large quantities, when scarcely

any can be detected at the other stations ; it also occurs in very large quantities with easterly winds, which is not the case at the other two stations. The Ozone observations at these stations confirm what has been stated by other observers, that the amount of Ozone increases with the altitude.

2.—INFLUENCE OF ATMOSPHERIC CHANGES UPON DISEASE.

The following remarks have been made upon a comparison of the meteorological curves with others which are appended to this paper, and which are drawn so as to show the prevalence of various diseases in Manchester, in each week, since the Weekly Return was published:—

Small Pox and Scarlatina have fortunately not been common in Manchester and Salford during the last 16 months, and therefore their curves give no certain indications of the influence of atmospheric changes, nor of the action of other agents.

Measles.—In the winter of 1860 and the first part of the year 1861 the amount of this disease was very small and fluctuated considerably, but did not show any *decided* increase or diminution with the changes of temperature ; but in the autumn of 1861, as soon as the temperature begins to fall, the measles curve rises rapidly, and continues to do so, on the whole, until the end of the year. It is remarkable, also, that 66 per cent. of its undulations rise and fall inversely as the degree of temperature, thus strengthening the opinion expressed by your Meteorological Sub-Committee, that measles are materially affected by changes of temperature, increasing generally with its fall.

Whooping Cough.—This disease was very little prevalent during the first part of the time noted ; it begins to rise suddenly in the week ending January 12th, after the severe cold of Christmas, 1860, but from that time it rises steadily, pursuing its course apparently unaffected by changes of temperature, until it reaches the extreme height of 56 new cases in the week ending November 23rd, 1861.

This would seem to be the natural course of a purely contagious disease, left to spread unchecked by any precautions taken by the parents to prevent intercourse of other children with those affected by it; and it seems probable, from the mortality occasioned by this disease, that many hundreds of children are sacrificed from want of care in this respect.

Bronchitis and Catarrh, Influenza and Pneumonia.—These diseases are all included under one head, and their course shown by one curve. The influence of low temperatures, in predisposing to these affections, is well shown by a comparison of their curve with that of temperature, although it will be found that the effects of changes of weather in this respect are not shown in the returns of disease until a week or fortnight after they have taken place; the curve of disease in the charts usually follows that of temperature at a distinct interval. Thus, although the disease curve rises in the autumn of 1860, as the temperature falls, yet a more rapid advance is delayed until the week ending December 29th, a fortnight after the decided fall in temperature in the week ending December 15th; and it does not reach its point of greatest prevalence until the week ending January 12th, leaving again a fortnight's interval from the extreme cold of the week ending December 29th.

The disease curve sinks to its lowest point (100 cases) on July 27th, and is again very low on August 31st, when the temperature first begins to diminish decidedly, after having been high for eleven weeks. From this point the disease curve again tends upwards.

Diarrhœa and Dysentery.—The curve of these diseases marks the influence which is exerted upon them by a temperature of more than sixty degrees, as was first shown by your committee in 1859. It is not merely that an increase in the number of cases accompanies a rise in temperature or vice versâ, but that when the temperature first rises above sixty degrees the great impulse is given to this disease, and it is when the temperature remains long above this point that a great number of cases of diarrhœa may be expected.

The curve of these diseases only begins to rise steadily in the week ending June 15th, when first the temperature is fairly above the

average of the season and above sixty degrees. In the week ending on July 6th, the temperature falls below sixty degrees, and the diseases seem to be checked for a time, the curve slightly sinking at this point; but in the week ending July 20th, when the temperature again rises above sixty degrees, it spreads rapidly and continues very high until September 1st when the temperature is again below sixty degrees and remains so, and the disease curve sinks again as rapidly as it arose.

The curve attains its highest point in the week ending July 27th, and remains there during the week ending August 3rd, when the temperature has been above the twelve years average for eight weeks.

3.—HEALTH OF MANCHESTER AND ST. MARYLEBONE, LONDON.

Through the kindness of Dr. R. D. Thompson, of London, monthly returns have been given of the new cases of disease coming under treatment at ten charitable institutions in St. Marylebone, London, and these have been accompanied by a similar record of cases occurring in pauper, charitable, and public institutions in Manchester and Salford.

From these tables charts have been drawn out, showing by means of curves the relative amount of disease of different kinds at the two places, from September, 1860, to November, 1861, inclusive,—the disease in London being represented by the continuous, in Manchester by the dotted line. From these data we gather that the number of persons receiving medical relief in London, is much greater in proportion to the population than in Manchester. The population of St. Marylebone, by the last census, is 161,609, that of Manchester and Salford 390,815; yet the number of new cases of disease attended every month in St. Marylebone exceeds, on the average, those attended in Manchester by more than 1,600. This disproportion between the relative amount of sickness in the two places can hardly be due to a really larger amount of sickness in London, since the death rate in St. Marylebone is 24 per 1,000 annually, as compared with 31 in

Manchester. It may be that greater facilities exist in London for obtaining gratuitous medical relief; or that, owing to the extent of the club system in Manchester, and to a greater spirit of independence, the working classes in this city are less willing to avail themselves of medical charities.

Although the numbers in these tables are thus not in exact correspondence, they may be used to measure the relative prevalence of the various diseases of the two places, and the fluctuations in their amount.

The rise and fall of disease is well shown by the curves projected upon the chart, and from these it may be seen that, notwithstanding the differing influences of position, climate, manufactures, occupations, &c., bearing upon the inhabitants of these two places, there is a remarkable correspondence between the undulations of several of the diseases, especially of measles, scarlatina, whooping-cough, diarrhœa, bronchitis, catarrh, and erysipelas; showing the influence of some widely-spread agencies over their production and propagation.

For the first few months of the period over which the comparison extends, the diseases of the zymotic class, as small-pox, chicken-pox, measles, scarlatina, and whooping-cough, were much more prevalent in St. Marylebone than in Manchester, and chicken-pox and scarlatina remain so during the whole period. Small-pox, though very low throughout, soon begins to prevail most in Manchester; and, in the autumn of 1861, the curves of measles and whooping-cough, in Manchester, rise considerably over those in London, although the total amount of disease noted still remains less in Manchester than in London.

Diarrhœa was throughout the period more prevalent in London than in Manchester, and rises to 1,900 new cases in August,—nearly four times the number that were noted in Manchester; but bronchitis and catarrh, erysipelas and dysentery, constantly prevailed much more in Manchester than in London.

All these differences in the prevalence of various diseases at the two places, if they should continue to appear in future years, would point to most interesting subjects for further enquiry; for instance,

the influence upon disease, not only of climate, drainage, &c., but also of occupations and trades, and of the various impurities in the atmospheres of these cities; and if the prevailing diseases of other large towns could be similarly recorded and compared, it seems probable that many important conclusions might be drawn respecting the circumstances causing, or at least predisposing to many of these complaints. The greater amount of moisture in the Manchester atmosphere might account for the prevalence of bronchitis and catarrh* in this city, and the smaller rain-fall in London may be one cause of the diarrhoea prevailing there, the sewage matter being less thoroughly cleared away.

It will be observed that no attempt has been made to compare the prevalence of continued fever or of insanity at the two places. It was found impossible, at the outset of feverish complaints, to distinguish with sufficient exactness between simple feverish attacks (febricula) and more serious disorders of this nature. The contributors to the returns in Manchester were therefore requested to include them all under one head; but in London we believe the attempt is made to present more accurate records, and thus a comparison is rendered impossible.

The returns of cases of insanity were also so faulty that no great reliance could be placed upon them, one case being frequently returned in several papers, as for instance, from the parish medical officer and from the workhouse; and thus, although in proportion to the population the amount of this disease in the two places was nearly the same, yet in relation to the total amount of disease it appeared to be nearly three times more frequent in Manchester than in St. Marylebone.

A. RANSOME.

G. V. VERNON.

* The probable presence of silenium, associated with sulphur, in the coal used in Manchester, has been suggested as a likely cause of the greater amount of irritation of the bronchial mucous membrane in Manchester.



